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For: HIGH FREQUENCY INFRARED RADIATION SOURCE

- 1           1.       A high frequency infrared radiation source comprising:
  - 2                               a hermetically sealed chamber with a plasma generating gas therein;
  - 3                               a pair of spaced electrodes in the chamber for creating a plasma there
  - 4       between;
  - 5                               a window in the chamber; and
  - 6                               a collimating lens made of infrared radiation transmissive material
  - 7       disposed between the pair of electrodes and the window.
  
- 1           2.       The high frequency infrared radiation source of claim 1 in which the plasma
- 2       generating gas is xenon.
  
- 1           3.       The high frequency infrared radiation source of claim 1 in which the
- 2       chamber is defined by a TO can including the window and a TO header which supports the
- 3       pair of spaced electrodes.
  
- 1           4.       The high frequency infrared radiation source of claim 1 in which the
- 2       collimating lens is hemispherical.
  
- 1           5.       The high frequency infrared radiation source of claim 1 in which the material
- 2       of the collimating lens is selected from the group consisting of sapphire, zinc selenide,
- 3       germanium, silicon, magnesium fluoride, calcium fluoride, calcium bromide, and cadmium

4 telluride.

1           6.       The high frequency infrared radiation source of claim 1 further including a  
2 window element sealed over the window and wherein the collimating lens is disposed  
3 behind the window element.

1           7.       The high frequency infrared radiation source of claim 6 in which the window  
2 element is made of infrared transmissive material.

1           8.       The high frequency infrared radiation source of claim 6 in which the  
2 infrared transmissive material is germanium.

1           9.       The high frequency infrared radiation source of claim 6 in which the window  
2 element is coated with an anti reflective material.

1           10.      The high frequency infrared radiation source of claim 6 in which the  
2 window element includes metalization and there is a sealing material between the  
3 metalization of the window element and the chamber.

1           11.      The high frequency infrared radiation source of claim 10 in which the  
2 sealing material is solder or braze.

1           12.    The high frequency infrared radiation source of claim 1 in which the  
2 collimating lens is sealed with respect to the window.

1           13.    The high frequency infrared radiation source of claim 12 in which the  
2 collimating lens includes metalization and there is a sealing material between the  
3 metalization of the lens and chamber.

1           14.    The high frequency infrared radiation source of claim 13 in which the  
2 sealing material is solder or braze.

1           15.    The high frequency infrared radiation source of claim 1 in which the pair of  
2 spaced electrodes are disposed above a support surface.

1           16.    The high frequency infrared radiation source of claim 15 further including a  
2 pair of posts extending upward from the support surface each having terminal ends which  
3 contain an electrode.

1           17.    The high frequency infrared radiation source of claim 15 further including a  
2 reflector disposed between the support surface and the electrodes.

1           18.    The high frequency infrared radiation source of claim 17 in which the  
2 reflector is in the shape of a collimating lens with a flat surface disposed closest to the  
3 electrodes and the remainder of the lens coated with a material which reflects infrared

4 radiation.

1 19. The high frequency infrared radiation source of claim 15 in which the  
2 support surface includes an absorbent coating.

1 20. The high frequency infrared radiation source of claim 1 in which the  
2 electrodes are disposed horizontally across from each other in the chamber.

1 21. The high frequency infrared radiation source of claim 1 in which the  
2 electrodes are disposed vertically with one upper electrode over a lower electrode in the  
3 chamber.

1 22. The high frequency infrared radiation source of claim 21 further including a  
2 reflector in the chamber surrounding the upper electrode.

1 23. The high frequency infrared radiation source of claim 22 in which the  
2 reflector includes a gold surface.

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1           24.    A high frequency infrared radiation source comprising:  
2                   a header;  
3                   a pair of spaced electrodes supported above the header;  
4                   a can sealed with respect to the header creating a sealed chamber  
5 containing the pair of spaced electrodes, the can having a window therein;  
6                   a gas in the chamber which creates a plasma between the electrodes;  
7 and  
8                   an optical path from the plasma through the window including only  
9 materials which transmit infrared radiation.

1           25.    The high frequency infrared radiation source of claim 24 in which the  
2 window is an opening in the can.

1           26.    The high frequency infrared radiation source of claim 24 further including an  
2 infrared transmissive element sealed over the opening.

1           27.    The high frequency infrared radiation source of claim 24 further including an  
2 infrared transmissive collimating lens sealed over the opening.

1           28.    The high frequency infrared radiation source of claim 24 further including  
2 both an infrared transmissive element sealed over the opening and an infrared transmissive  
3 collimating lens adjacent the transmissive element.

1           29.     The high frequency infrared radiation source of claim 24 in which the  
2     plasma generating gas is xenon.

1           30.     The high frequency infrared radiation source of claim 24 in which the header  
2     is a TO header and the can is a TO can.

1           31.     The high frequency infrared radiation source of claim 24 further including a  
2     reflector disposed between the header and the electrodes.

1           32.     The high frequency infrared radiation source of claim 31 in which the  
2     reflector is in the shape of a collimating lens with a flat surface disposed closest to the  
3     electrodes.

1           33.     The high frequency infrared radiation source of claim 32 in which the  
2     collimating lens is coated with a material which reflects infrared radiation.

1           34.     The high frequency infrared radiation source of claim 24 in which the header  
2     includes an optically absorbent coating thereon.